

CR-91 Event – Shelby County, AL  
Preliminary Air Monitoring Summary  
September 18, 2016 05:00

*Prepared by*  
*Center for Toxicology and Environmental Health, L.L.C. (CTEH®)*  
*On Behalf of Colonial Pipeline*



## Introduction

On September 9, 2016, the Center for Toxicology and Environmental Health, L.L.C. (CTEH®) initiated air monitoring in support of response efforts to the gasoline release in Shelby County, AL. This report presents the real-time air monitoring data recorded from September 17 2016 17:00 to September 18, 2016 05:00 CDT.

## Real-Time Air Monitoring<sup>1</sup>

Real-time air monitoring was conducted to evaluate the potential airborne presence of gasoline-associated constituents, if any, during response operations. All instrumentation was calibrated at least once per day or per manufacturer's recommendations. Target analytes were measured as total volatile organic compounds (VOCs), oxygen, benzene, and flammability as the percent of the lower explosive limit (LEL) using remote telemetering RAESystems® AreaRAEs, hand-held instruments such as RAESystems® MultiRAE Pro/Plus' and UltraRAEs, as well as Gastec® colorimetric detection tubes.

During this monitoring period, two LEL and six VOC action level exceedances were recorded during worker activity monitoring, including instantaneous VOC and benzene readings which were recorded above the action level. When necessary, workers egressed the area in accordance with the approved sampling and analysis plan.

**Table 1**, below, presents the results of real-time air monitoring using hand-held instruments. Maps of the incident site location and locations of hand-held real-time air monitoring readings are provided in **Appendix I**.

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<sup>1</sup> Real-time air monitoring refers to the use of hand-held instruments that provide near-instantaneous readings of an airborne chemical concentration without the need for laboratory analysis.

*Table 1: Hand-Held Real-Time Air Monitoring Summary<sup>1</sup>  
September 17, 2016 17:00 to September 18, 2016 05:00*

Location Category	Analyte	Instrument	Count of Readings	Count of Detections	Range of Detections <sup>2,3</sup>
Worker Activity Monitoring	Benzene	Gastec #121L	1	0	<0.05 ppm
		UltraRAE	73	10	0.05 - 0.3 ppm
	%LEL	MultiRAE Plus	55	0	<1 %
		MultiRAE Pro	149	3	3 - 6 %
	O <sub>2</sub>	MultiRAE Pro	2	2	20.9 - 20.9 %
	VOCs	MultiRAE Plus	47	5	0.1 - 9 ppm
		MultiRAE Pro	159	57	0.1 - 638 ppm
	%LEL	MultiRAE Pro	3	2	4 - 8 %
Site Characterization	VOC	MultiRAE Pro	3	3	125 - 352.8 ppm

<sup>1</sup>Please Note: The data displayed in the above table has not undergone complete QC analysis and is presented in a preliminary format.

<sup>2</sup>Maximum detections preceded by the "<" symbol are considered non-detections below the instrument limit of detection (LoD) value to the right.

<sup>3</sup>Numbers are the raw values, no correction factors have been applied.

During this monitoring period remote telemetering equipment recorded 7851 detections of VOCs above the CTEH established action level of 30 ppm and 11 detections of LEL above the CTEH established action level of 10% (3% as raw values on LEL sensors).

**Table 2** (below) summarizes remote telemetering AreaRAE data for this monitoring period. For this reporting period AreaRAE monitoring data may contain drift events<sup>2</sup>. **Appendix I** and **Appendix II** include location maps and graphs for remote telemetering data, respectively. <sup>4</sup>

<sup>2</sup> Drift is defined as any interference in the PID's or electrochemical sensor's ability to accurately report the concentration of a chemical in the atmosphere. Humidity, rapid temperature changes, and compromised batteries are examples of common sources of drift.

Table 2: Remote Telemetry Real-time Air Monitoring Summary<sup>1,3</sup>

September 17, 2016 17:00 to September 18, 2016 05:00

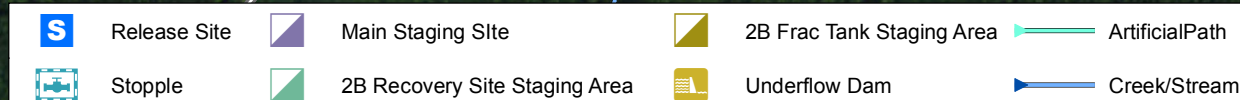
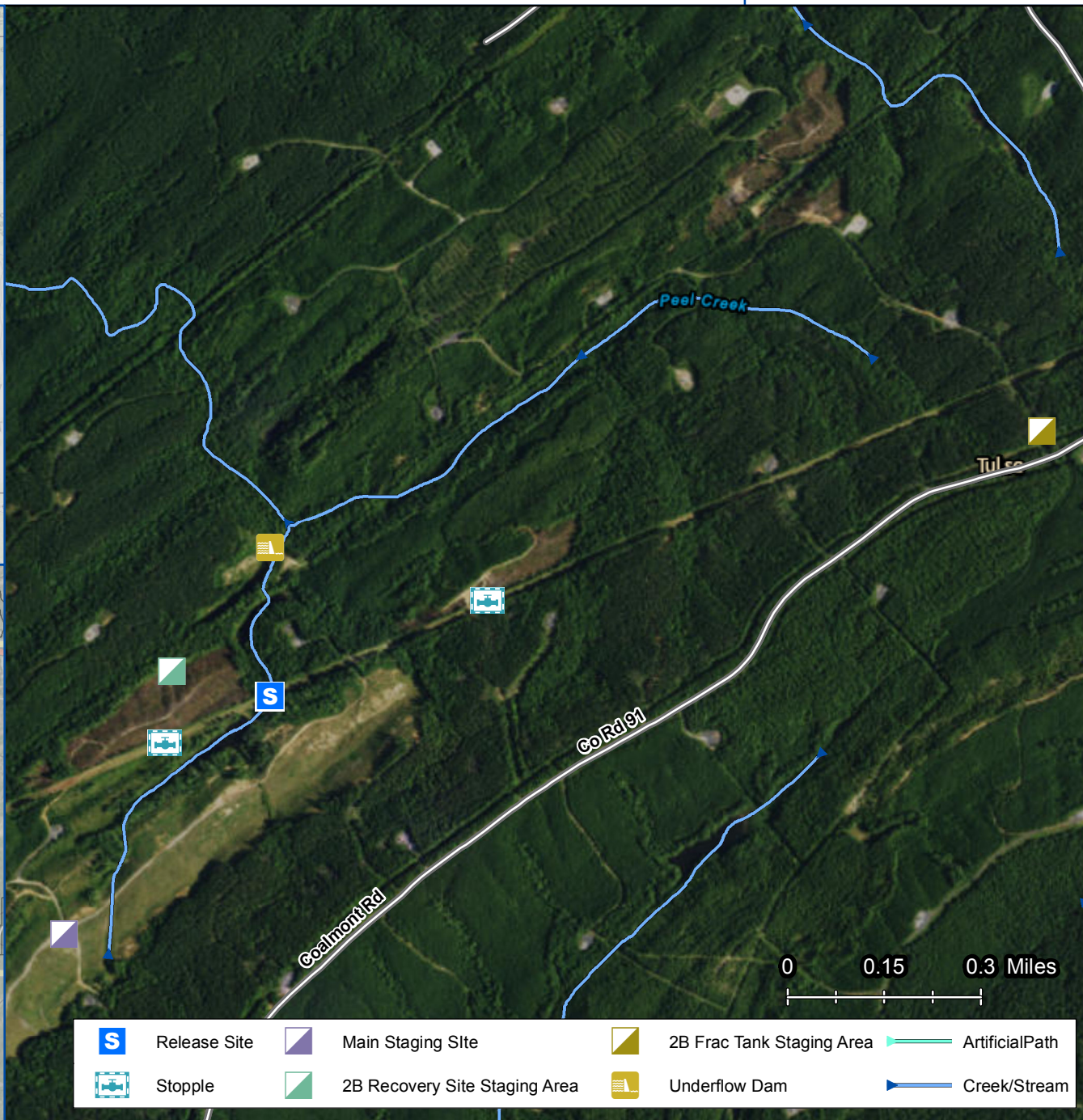
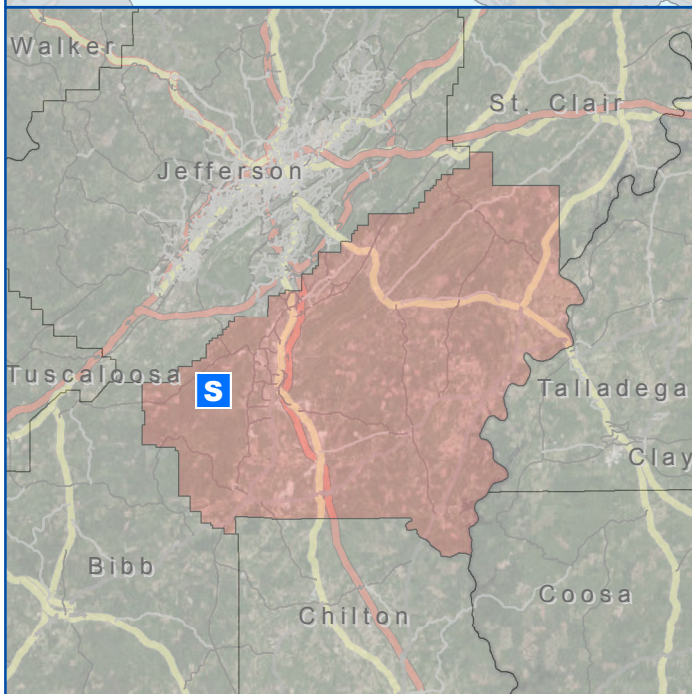
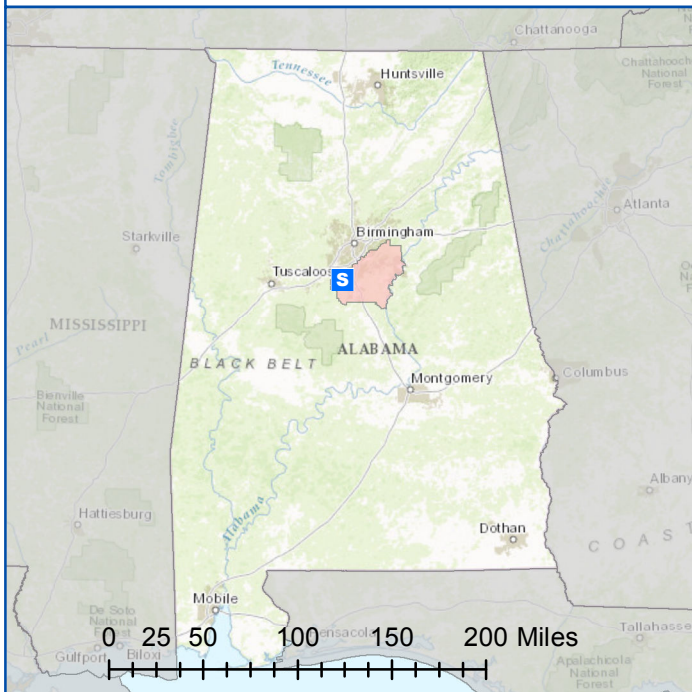
Unit	Location Description	Analyte	Count of Readings	Count of Detections	Range of Detections <sup>2</sup>
AR01	2A Compressors	LEL	8382	38	1.1 - 4.9 %
		O <sub>2</sub>	8382	8382	20.9 - 20.9 %
		VOC	8382	6867	0.1 - 276.5 ppm
AR04	2A Frac Tank Staging	LEL	7315	0	<1 %
		O <sub>2</sub>	7315	7315	20.9 - 20.9 %
		VOC	7315	7315	0.2 - 105.4 ppm
AR05	2A Recovery	LEL	8464	0	<1 %
		O <sub>2</sub>	8464	8464	20.9 - 20.9 %
		VOC	8464	1908	0.1 - 24.5 ppm
AR06	East of Release Site/Near Stopple 2	LEL	7397	0	<1 %
		O <sub>2</sub>	7397	7397	20.9 - 21.4 %
		VOC	7397	4208	0.1 - 123.7 ppm
AR07	2B Recovery	LEL	8368	0	<1 %
		O <sub>2</sub>	8368	8368	20.9 - 20.9 %
		VOC	8368	3779	0.1 - 14.8 ppm
AR08	Main Staging Area Frac Tanks	LEL	7242	0	<1 %
		O <sub>2</sub>	7242	7242	20.9 - 20.9 %
		VOC	7242	7242	0.5 - 736.4 ppm
AR09	Release Site	LEL	8382	0	<1 %
		O <sub>2</sub>	8382	8382	20.9 - 20.9 %
		VOC	8382	8382	4.8 - 166.7 ppm
AR10	On path between Recovery 2A and Recovery 2B.	LEL	8380	0	<1 %
		O <sub>2</sub>	8380	8380	20.9 - 20.9 %
		VOC	8380	5279	0.1 - 123.5 ppm
AR11	Main Staging Entrance East of TRG checkpoint	LEL	8398	0	<1 %
		O <sub>2</sub>	8398	8398	20.9 - 20.9 %
		VOC	8398	0	<0.1 ppm
AS12	Boom Site #2	LEL	2380	0	<1 %
		VOC	2380	1	0.3 ppm
AR13	TRG Checkpoint 2 - access to stopple 1, Recovery 2A and 2A Frac Tank Staging Area.	LEL	8390	0	<1 %
		O <sub>2</sub>	8390	8390	20.9 - 20.9 %
		VOC	8390	8390	0.3 - 2.1 ppm
AR14	Cab of excavator at release site	LEL	7815	0	<1 %
		O <sub>2</sub>	7815	7815	20.9 - 20.9 %
		VOC	7815	7815	0.7 - 30.1 ppm

<sup>1</sup>Please note: The data displayed here has not undergone complete QA/QC analysis and is presented in a preliminary format.<sup>2</sup>Maximum detections preceded by the "<" symbol are considered at the limit of detection (LoD) value to the right.<sup>3</sup>LEL and VOC values are raw values, correction factors have not been applied.

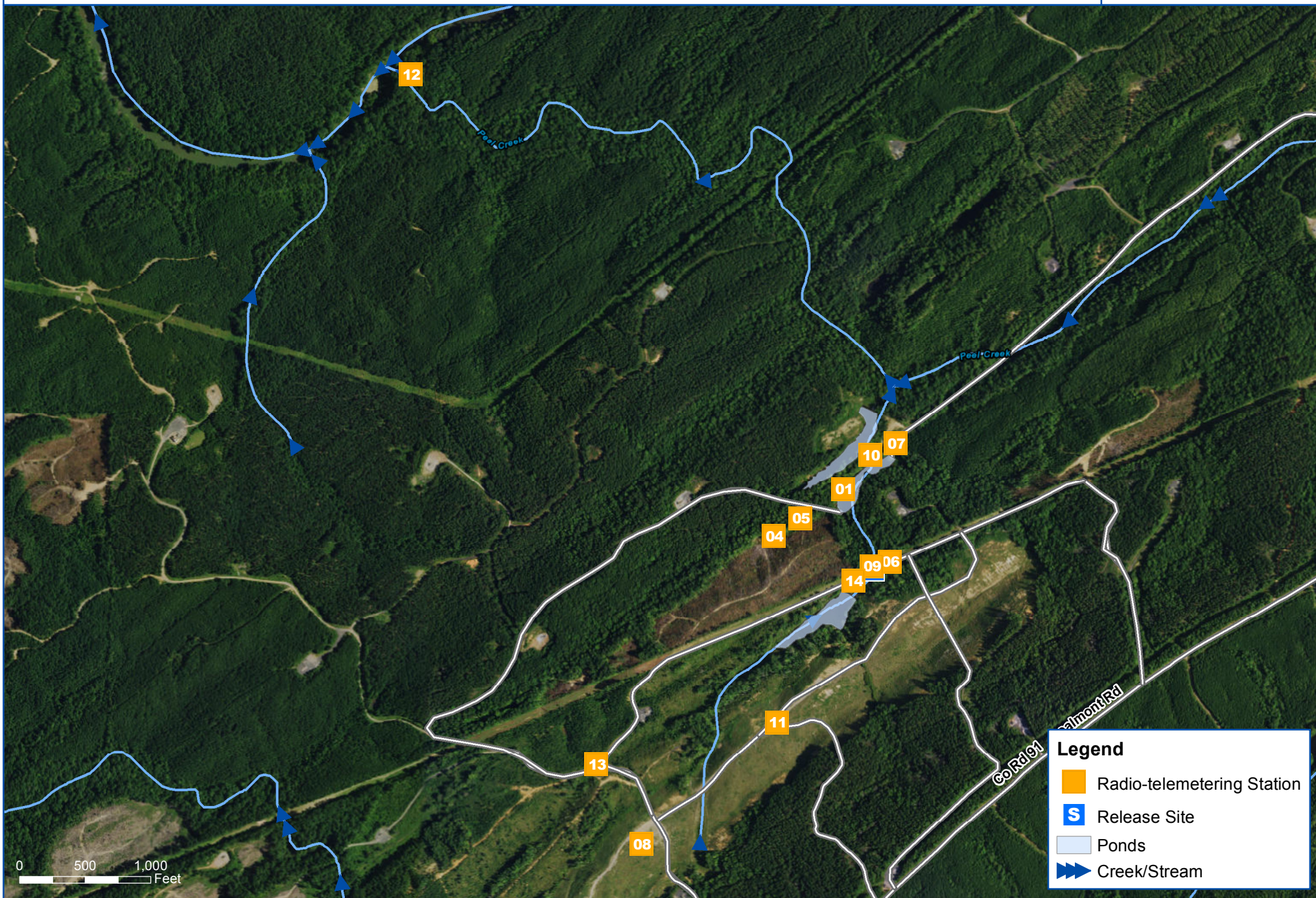


# Appendix I:

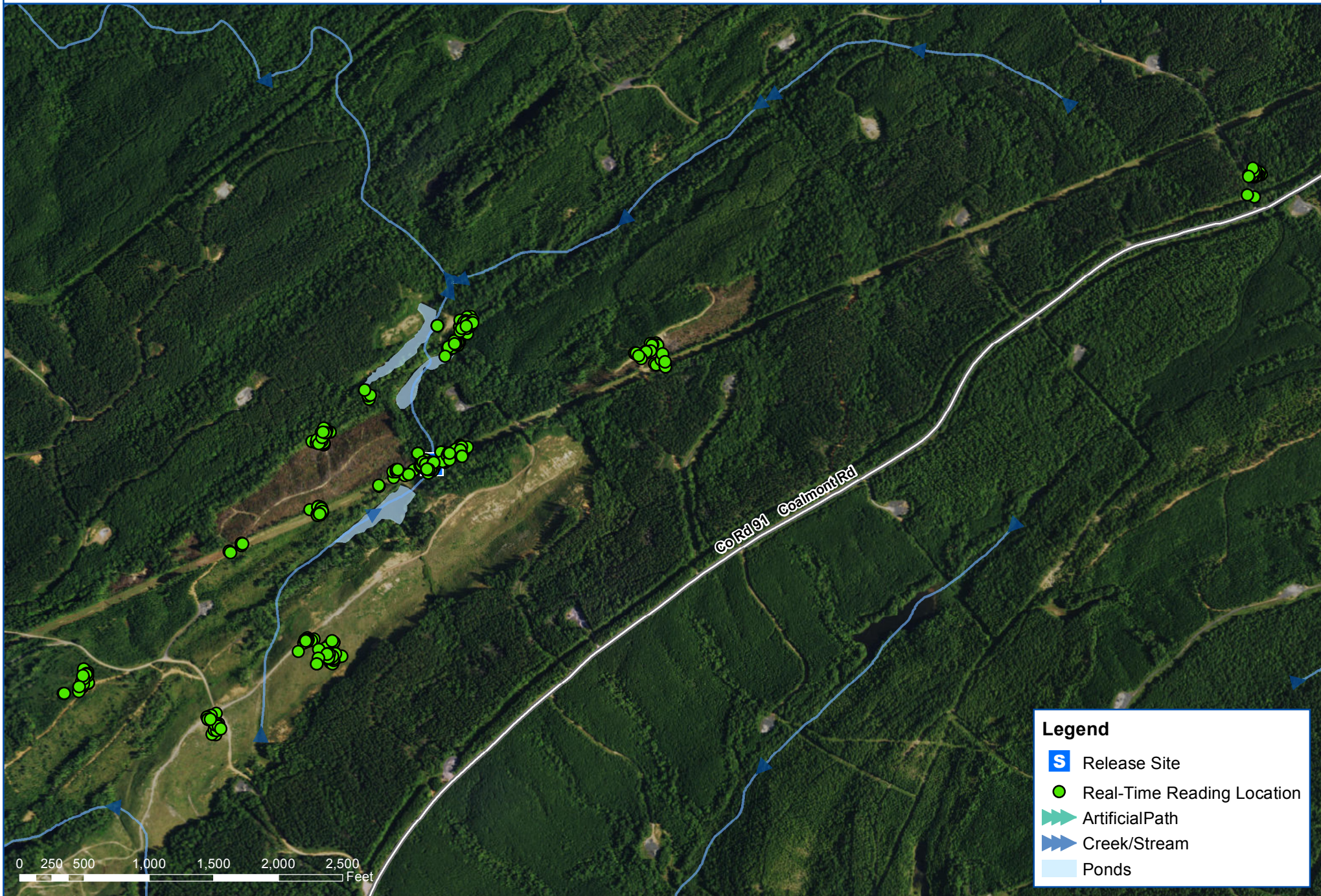
Site Location, Hand-Held Real-Time  
Air Monitoring Location, and  
Remote Telemetry Air Monitoring  
Location Maps



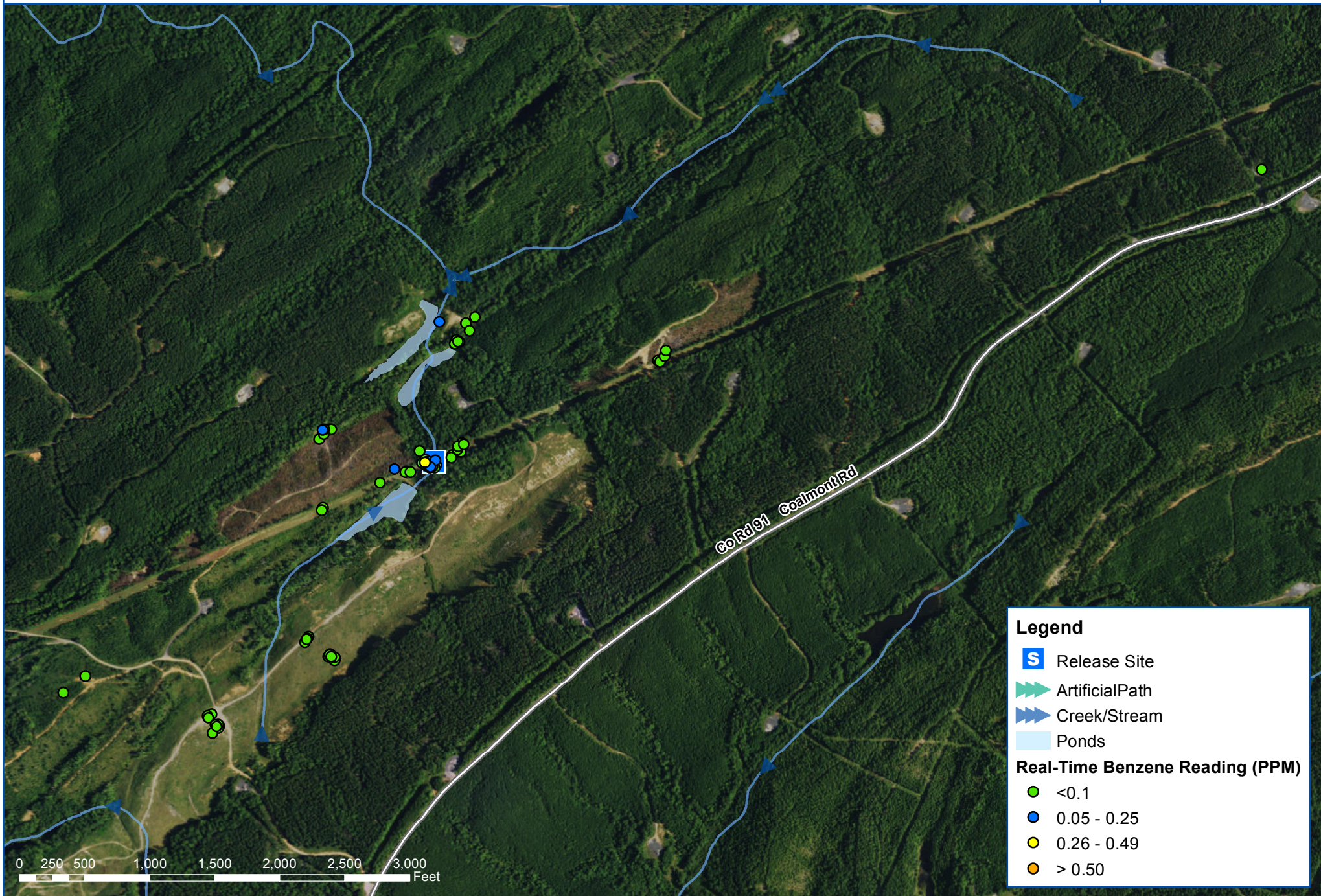




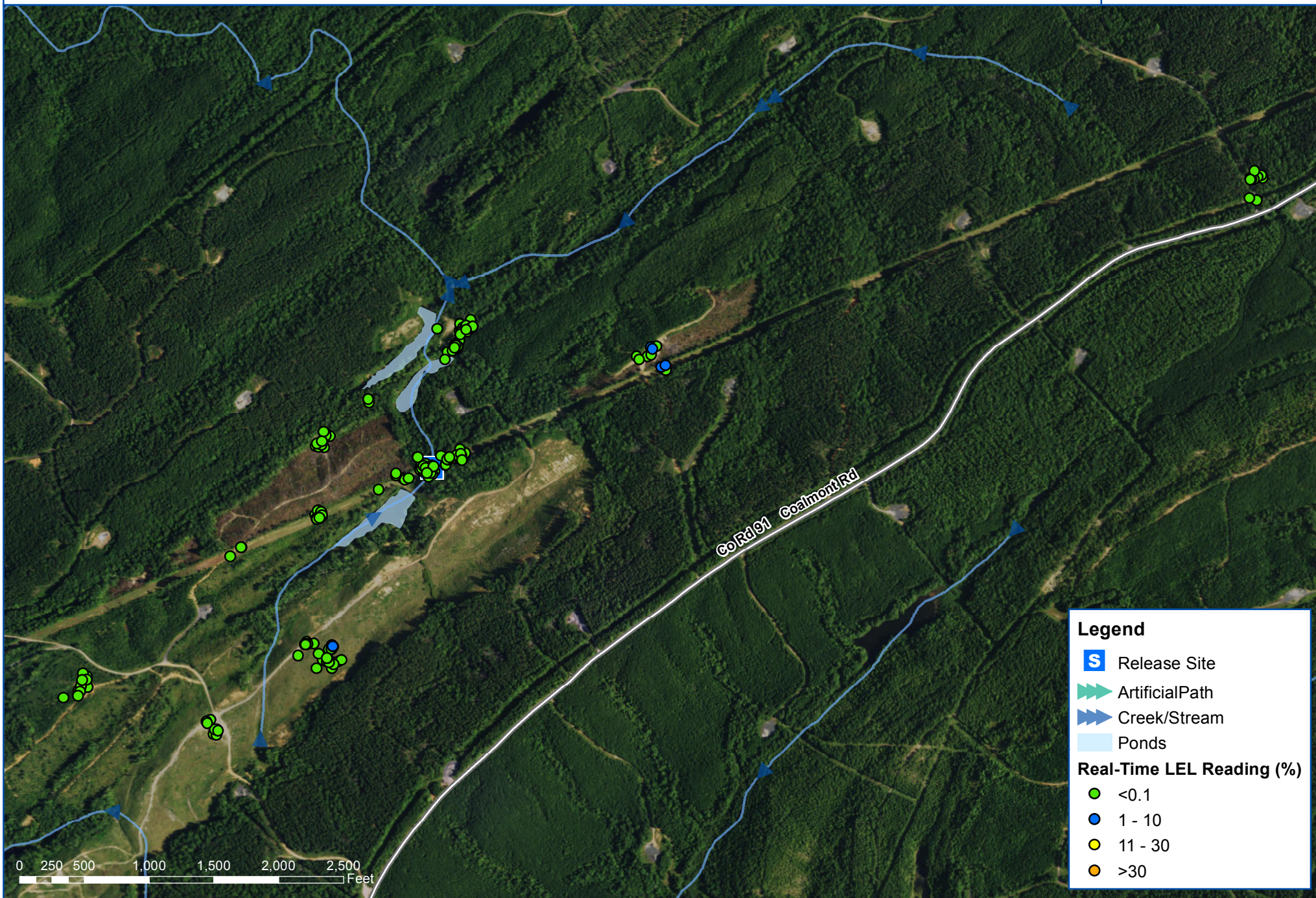




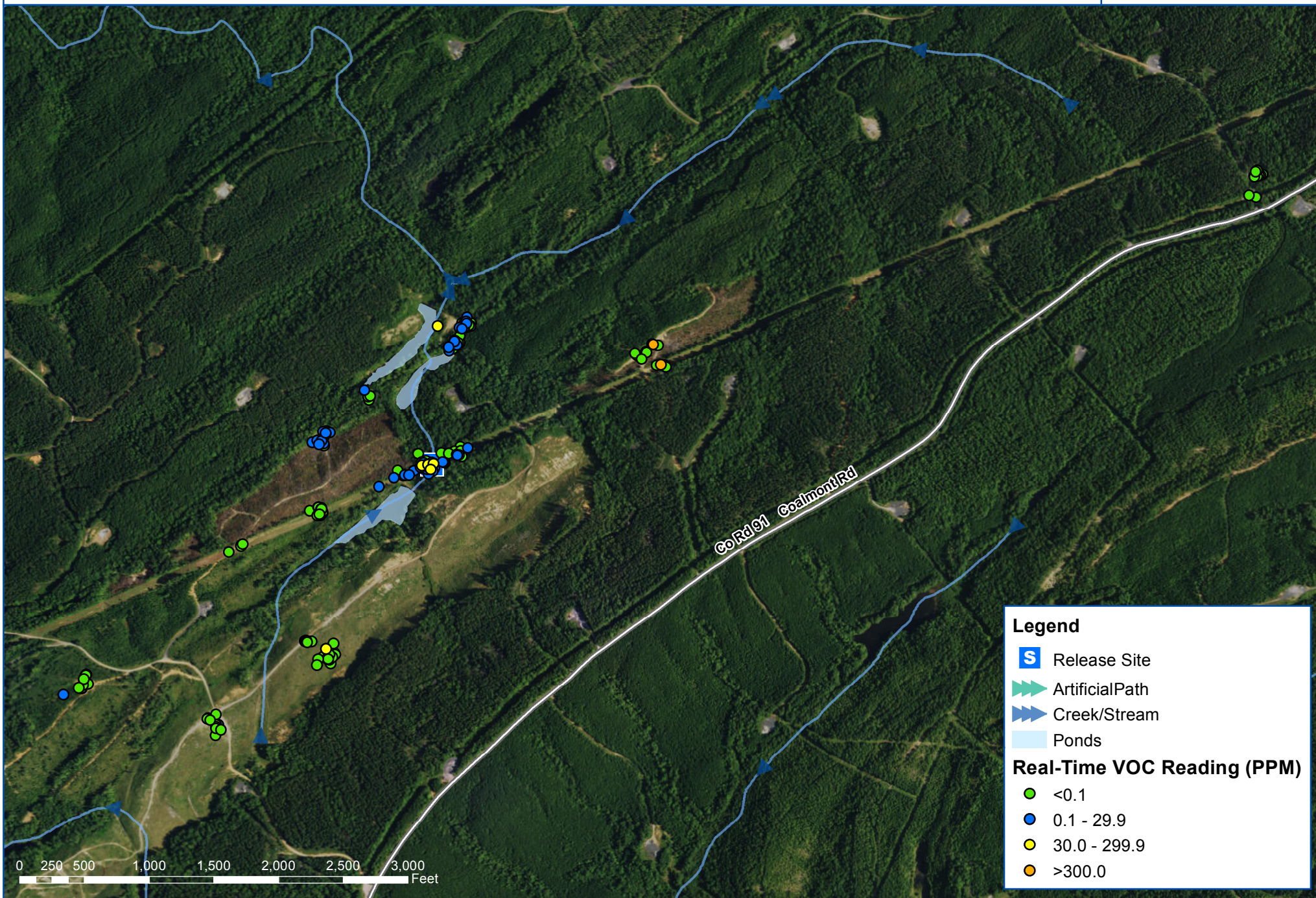














# Appendix II:

## Remote Telemetry Air Monitoring Graphs



CR-91 Event | 9/17/2016 17:01 to 9/18/2016 04:59

CR-91 Event | 9/17/2016 17:01 to 9/18/2016 04:59



LEL readings are a true representation of atmospheric conditions (appropriate correction factors have been applied to field values).

## Remote Telemetry Real-time Air Monitoring | VOC

CR-91 Event | 9/17/2016 17:01 to 9/18/2016 04:59

Unit / Location



VOC readings are a true representation of atmospheric conditions (appropriate correction factors have been applied to field values).

## Remote Telemetry Real-time Air Monitoring | Oxygen

CR-91 Event | 9/17/2016 17:01 to 9/18/2016 04:59

